



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,900	09/19/2003	Jean M.J. Frechet	1B-1829	7022
8076	7590	09/24/2007	EXAMINER	
LAWRENCE BERKELEY NATIONAL LABORATORY ONE CYCLOTRON ROAD, MAIL STOP 90B UNIVERSITY OF CALIFORNIA BERKELEY, CA 94720			NAGPAUL, JYOTI	
			ART UNIT	PAPER NUMBER
			1743	
			MAIL DATE	DELIVERY MODE
			09/24/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/665,900

Applicant(s)

FRECHET ET AL.

Examiner

Jyoti Nagpaul

Art Unit

1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 16-19 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

Remarks/arguments filed on July 3, 2007 has been acknowledged. Claims 1-22 are pending.

#### ***Response to Amendment***

Upon further consideration, Examiner respectfully withdraws the allowability of Claims 1-22.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

Art Unit: 1743

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1-15 and 20-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Derand (US 2002/0125135) in view of Yu.

Derand teaches a microfluidic device comprising a set of one or more covered microchannel structures manufactured in the surface of a planar substrate. (See abstract) Derand teaches a first polymer attached to the channel through photoinitiated grafting of a first monomer to selected regions of the channel surface. (See [0065-0070]) Derand further teaches wherein the substrate is thermoplastic and transparent to light in the wavelength range of 200 to 350 nm. (See [0073]) The thermoplastic substrate is selected from the group consisting of poly(methyl methacrylate), poly(butyl methacrylate), poly(dimethylsiloxane), polyolefin, cyclic olefin copolymer, polyethylene, polypropylene, poly(ethylene terephthalate), poly(butylene terephthalate), polyimide and hydrogenated polystyrene. (See [0073]) The thermoplastic substrate is a polyolefin. (See [0073]) Derand further teaches the channel is 10-200 micrometers deep. (See [0060]) Derand further teaches the first polymer attached to the channel surface for grafting is comprised of one or more monomers selected from the group consisting of a polyvinyl monomer, a monovinyl monomer, and a mixture of a polyvinyl and monovinyl monomer. (See [0067-0068]) Derand further teaches one or more monomer is a monovinyl monomer which is selected from the group consisting of acrylic acids, methacrylic acids, acrylamides, methacrylamide alkyl derivatives of methacrylamide,

Art Unit: 1743

alkyl derivatives of acrylamide, alkyl acrylates, alkyl methacrylates, perfluorinated alkyl acrylates, perfluorinated alkyl methacrylates, hydroxyalkyl acrylates and hydroxyalkyl methacrylates, wherein the alkyl group in each of the aforementioned alkyl monomers has 1-10 carbon atoms, oligoethyleneoxide acrylates, oligoethyleneoxide methacrylates, vinylazlactones, and acrylate and methacrylate derivatives including primary, secondary, tertiary, and quaternary amine functionalities and zwitterionic functionalities. (See [0067-0068])

Derand fails to teach a porous polymer monolith, comprised of a second monomer, in the channel, and attached to the first polymer in the selected regions. The first and second monomers may be the same or different. Derand further fails to teach the porous polymer monolith is comprised of one or more polymerized monomers selected from the group consisting of polyvinyl monomers or a mixture of polyvinyl and monovinyl monomers. Derand further fails to teach one or more monomer for the monolith is a polyvinyl monomers which is selected from the group consisting of alkylene diacrylates, alkylene dimethacrylates, hydroxyalkylene diacrylates, hydroxyalkylene dimethacrylates, alkylene bisacrylamides, alkylene bismethacrylamides, wherein the alkylene group each of the aforementioned alkylene monomers has 1-6 carbon atoms, oligoethylene glycol diacrylates, oligoethylene dimethacrylates, diallyl esters of polycarboxylic acids, divinyl ethers, pentaerythritol di-, tri-, or tetraacrylates, pentaerythritol di-, tri-, or tetra methacrylates, trimethylopropane triacrylates and trimethylopropane trimethacrylates. Derand further fails to teach one or more monomer for the monolith is a monovinyl monomers which is selected from the

Art Unit: 1743

group consisting of acrylic acids, methacrylic acids, acrylamides, methacrylamide alkyl derivatives of methacrylamide, alkyl derivatives of acrylamide, alkyl acrylates, alkyl methacrylates, perfluorinated alkyl acrylates, perfluorinated alkyl methacrylates, hydroxyalkyl acrylates and hydroxyalkyl methacrylates, wherein the alkyl group in each of the aforementioned alkyl monomers has 1-10 carbon atoms, oligoethyleneoxide acrylates, oligoethyleneoxide methacrylates, vinylazlactones, and acrylate and methacrylate derivatives including primary, secondary, tertiary, and quaternary amine functionalities and zwitterionic functionalities. Derand further fails to teach the porous monolith is comprised of a mixture of monomers selected from the group consisting of HEMA, EDMA and BuMA.

Yu teaches microfabricated devices comprising a network of channels formed in a polymer plate. Yu teaches the preparation of monolith materials in the channels of microfluidic devices. Yu teaches the porous polymer monolith is comprised of one more comprised of one or more polymerized monomers selected from the group consisting of polyvinyl monomers or a mixture of polyvinyl and monovinyl monomers. (See pgs 756-768) Derand further teaches the porous monolith is comprised of a mixture of monomers selected from the group consisting of HEMA, EDMA and BuMA. (See pgs 756-768)

It would have been obvious to one having ordinary skill in the art to provide a porous polymer monolith as disclosed in Yu in the channel of Derand to achieve the predictable results of increasing the use of Derand's systems in applications such as separations and chromatography.

***Allowable Subject Matter***

5. **Claims 16-19 and 22** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Prior art fails to teach a third monomer having a functional group, wherein the polymer chain attached to a portion of the porous polymer monolith by photoinitiated grafting of the third monomer. The first and second monomers may be the same or different and the third monomer is different from the second monomer.

***Response to Arguments***

6. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jyoti Nagpaul whose telephone number is 571-272-1273. The examiner can normally be reached on Monday thru Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.